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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/668,846	09/22/2000	Jacek Stachurski	TI-29491	2446

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EXAMINER	
LERNER, MARTIN	
ART UNIT	**PAPER NUMBER**
2654	2

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/668,846	STACHURSKI ET AL.	
	Examiner	Art Unit	
	Martin Lerner	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3* is/are rejected.

7)☒ Claim(s) *2 and 4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicants' Specification, Page 1, notes a claim for priority from provisional applications, Serial Numbers 60,155,517, 60/155,439, and 60,155,438, all filed 22 September 1999. However, Applicants' Declaration only claims priority with respect to one of these, Serial No. 60/155,517. Applicants may wish to request a corrected filing receipt to ensure any issued patent indicates a priority claim for all three provisional applications.

Drawings

2. The drawings are objected to because of the following defects:

Figure 3a should be labeled Figure 3. Page 4 of the Specification, Brief Description of the Drawings, refers to Figure 3, not Figure 3a.

The Specification does not appear to describe either Figure 3 or Figure 3a. There does not seem to be any reference to Figure 3 in the Description of the Preferred Embodiments.

Applicants' hand corrected changes to the numbering of the figures make it more difficult to understand the invention with respect to the Description of the Preferred Embodiments. Formal drawings should be submitted to clarify the numbering of the drawings.

The drawings are generally informal due to the presence of hand numbering and hand lettering.

A proposed drawing correction or corrected drawings are required in reply to the Office Action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

On page 4, line 8, "feature" should be –features—.

On page 6, last line, "Quantization 112" should be –Quantization 110—. See Figure 1.

On page 7, line 23, the sentence "provides . . ." is incomplete.

On page 12, line 2, the reference to Figures 3b and 3c is incorrect. There are no Figures 3b and 3c.

On page 13, line 12, shouldn't "six 20-sample subframes" be –eight 20-sample subframes—? If there are 160 samples, then there would have to be eight 20-sample subframes. (8 x 20 = 160)

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Gersho et al.* in view of *Iyengar et al.*

Regarding independent claim 1, *Gersho et al.* discloses a hybrid speech encoder, comprising:

"a linear prediction, pitch, and voicing analyzer" – a speech signal 12 undergoes Linear Prediction (LP) analysis by LP module 14; for every frame, a speech classifier/pitch/voicing (CPV) module 18 classifies the speech, and generates pitch data 44 and voicing data 46 (column 13, lines 1 to 56: Figure 4A);

"a parametric encoder coupled to said analyzer" – voiced (harmonic) coder 30 (column 13, lines 1 to 56: Figure 4A); a harmonic coder is a vocoder based on a parametric description of the target input speech (column 4, lines 7 to 17);

"a waveform encoder coupled to said analyzer" – transition coder 32 (column 13, lines 1 to 56: Figure 4A); in the case of transition segments, an analysis-by-synthesis waveform matching coder is used (column 14, lines 16 to 18: Figures 4A and 4D); many possible waveform coding models can be used for transition signal coding (column 26, lines 16 to 37);

"wherein said parametric encoder encodes strongly-voiced frames and said waveform encoder encodes both unvoiced and weakly-voiced frames [including a pitch-prediction filter for weakly-voiced frames]" – harmonic coding ("parametric encoder") is used for steady state voiced speech ("strongly-voiced frames") (column 10, lines 55 to 57; column 25, lines 14 to 43: Figure 4A); a stationary unvoiced coder 28 encodes unvoiced speech; a noise-like coder is used for encoding stationary unvoiced speech (column 11, lines 15 to 24: Figure 4A); a waveform encoder encodes stationary unvoiced speech ("unvoiced frames") using random noise vectors for representing the excitation (column 14, lines 38 to 40); transition coder 32 encodes transition segments ("weakly-voiced frames") as an analysis-by-synthesis waveform matching coder (column 14, lines 16 to 27: Figures 4A and 4D); waveform coding methods can be used for transition speech (column 26, lines 16 to 37).

The only element not clearly disclosed by *Gersho et al.* is "including a pitch-prediction filter for weakly-voiced frames." However, *Gersho et al.* discloses a weighted synthesis filter 66 for transition segments ("weakly-voiced frames") (column 14, lines 16 to 20: Figure 4D) Those skilled in the art would know that a pitch-prediction filter is a common element in speech encoders for introducing periodicity into the signal. *Iyengar et al.* teaches a wideband speech encoder with a pitch synthesis filter ("pitch prediction filter") to introduce an appropriate line spectrum component into a band. (Column 7, Line 43 to Column 8, Line 49) A pitch synthesis filter is the same as a pitch prediction filter. (Compare Specification, Page 18, Lines 1 to 4, defining the filter function for a pitch-prediction filter as $(1-gD^p)$ with the Equation at Column 7, Lines 60 to 61.) *Iyengar*

et al. specifically notes that certain segments during the beginning of words that are preceded by silence yield an unstable pitch synthesis filter, but energy normalization can be carried out to scale the output of the pitch synthesis filter to circumvent the problem. (Column 8, Lines 36 to 49) Thus, *Iyengar et al.* suggests a pitch synthesis filter can still be used for transition segments to introduce an appropriate line spectrum component into the output signal. It would have been obvious to one having ordinary skill in the art to include a pitch-prediction filter for weakly-voiced frames in the hybrid encoder of *Gersho et al.* as suggested by *Iyengar et al.* for the purpose of introducing a periodic component into weakly-voiced frames.

Regarding independent claim 3, *Gersho et al.* discloses a hybrid speech decoder, comprising:

"a linear prediction synthesizer" – a conventional LP Synthesizer 118 produces reconstructed speech 20 using previous LP parameters from the encoder (column 14, lines 46 to 57: Figure 5);

"a parametric decoder coupled to said synthesizer" – Voiced (Harmonic) Decoder 112 (column 14, lines 46 to 57: Figure 5); a harmonic coder is a vocoder based on a parametric description of the target input speech (column 4, lines 7 to 17); thus, a harmonic decoder is a parametric decoder;

"a waveform decoder coupled to said synthesizer" – Transition Decoder 114 (column 14, lines 46 to 57: Figure 5); in the case of transition segments, an analysis-by-synthesis waveform matching coder is used (column 14, lines 16 to 18: Figures 4A and

4D); many possible waveform coding models can be used for transition signal coding (column 26, lines 16 to 37); thus, a transition decoder is a waveform decoder;

"wherein said parametric decoder decodes excitation for strongly-voiced frames and said waveform decoder decodes excitations for both unvoiced and weakly-voiced frames [including a pitch predictor for weakly-voiced frames]" – harmonic coding is used for steady state voiced speech (column 10, lines 55 to 57; column 25, lines 14 to 43: Figure 4A); a stationary unvoiced coder 28 encodes unvoiced speech; a noise-like coder is used for encoding stationary unvoiced speech (column 11, lines 15 to 24: Figure 4A); a waveform encoder encodes stationary unvoiced speech using random noise vectors for representing the excitation (column 14, lines 38 to 40); transition coder 32 encodes transition segments as an analysis-by-synthesis waveform matching coder (column 14, lines 16 to 27: Figures 4A and 4D); waveform coding methods can be used for transition speech (column 26, lines 16 to 37); thus, Voiced (Harmonic) Decoder 112 is a parametric decoder that correspondingly decodes steady state voiced speech ("strongly-voiced frames"), Stationary Unvoiced Decoder 110 is a waveform decoder that correspondingly decodes unvoiced frames, and Transition Decoder 114 is a waveform decoder that correspondingly decodes transition frames ("weakly-voiced frames").

The only element not clearly disclosed by *Gersho et al.* is "including a pitch-prediction filter for weakly-voiced frames." However, *Gersho et al.* discloses a weighted synthesis filter 66 for transition segments ("weakly-voiced frames") in the encoder (column 14, lines 16 to 20: Figure 4D) Those skilled in the art would know that a pitch-

prediction filter is a common element in both speech encoders and speech decoders for introducing periodicity into the signal. *Iyengar et al.* teaches a wideband speech encoder with a pitch synthesis filter ("pitch prediction filter") to introduce an appropriate line spectrum component into a band. (Column 7, Line 43 to Column 8, Line 49) A pitch synthesis filter is the same as a pitch prediction filter. (Compare Specification, Page 18, Lines 1 to 4, defining the filter function for a pitch-prediction filter as $(1-gD^p)$ with the Equation at Column 7, Lines 60 to 61.) *Iyengar et al.* specifically notes that certain segments during the beginning of words that are preceded by silence yield an unstable pitch synthesis filter, but energy normalization can be carried out to scale the output of the pitch synthesis filter to circumvent the problem. (Column 8, Lines 36 to 49) Thus, *Iyengar et al.* suggests a pitch synthesis filter can still be used for transition segments to introduce an appropriate line spectrum component into the output signal. It would have been obvious to one having ordinary skill in the art to include a pitch-prediction filter for weakly-voiced frames in the hybrid decoder of *Gersho et al.* as suggested by *Iyengar et al.* for the purpose of introducing a periodic component into weakly-voiced frames.

Allowable Subject Matter

6. Claims 2 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Ozawa teaches pitch synthesis filters 28, 45 for both an encoder and a decoder (Figures 3 and 4).

Aguilar et al. and Zinser, Jr. et al. disclose related hybrid encoders/decoders.

Cuperman et al., Swaminathan et al., Das, Haagen et al., and Shoham disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ML
4/19/04

Martin Lerner
Examiner
Group Art Unit 2654